WHAT IS CLAIMED IS:

1. A waveguide device which acts as a waveguide in at least one direction thereof, the device comprising:

a core having a pump input surface for receiving pumping radiation at a pumping wavelength and at least one output surface for emitting a laser beam at an output wavelength; and

means for providing pump-light confinement and means for providing output mode control in different sections of the device along the direction of beam propagation.

2. The device as claimed in claim 1 wherein the core is a single member.

3. The device as claimed in claim 1 wherein the core includes an active core member and a passive core member.

4. The device as claimed in claim 1 wherein the means for providing pump-light confinement includes a pump-light containment component in contact with a surface of the core in a pumping section of the device.

5. The device as claimed in claim 4 wherein the pump-light containment component is a pump cladding.

6. The device as claimed in claim 1 wherein the means for providing output mode control includes a coating in contact with the core.

7. The device as claimed in claim 5 wherein the means for providing output mode control includes a mode control cladding in contact with the core.

8. The device as claimed in claim 1 wherein the means for providing output mode control includes a grating in contact with the core.

9. The device as claimed in claim 1 wherein the core is a planar core.

10. The device as claimed in claim 1 wherein the core is a cylindrical core.

11. The device as claimed in claim 1 further comprising a substrate for supporting the core.

12. The device as claimed in claim 1 wherein the device is a laser.

13. The device as claimed in claim 12 wherein the laser is a planar waveguide laser.

14. The device as claimed in claim 1 wherein the core has laser input surface for receiving a source laser beam to be amplified and wherein the device is a optical amplifier.

15. The device as claimed in claim 14 wherein the core is planar and wherein the optical amplifier is a planar waveguide amplifier.

16. The device as claimed in claim 14 wherein the laser input surface is different from either the pumping input surface or the at least one output surface.

17. The device as claimed in claim 14 wherein the laser input surface is the same as the at least one output surface.

18. The device as claimed in claim 1 wherein an output mode control section of the device has a lower NA than a pumping section of the device.

19. The device as claimed in claim 18 wherein the pumping section has a NA greater than 0.05.

20. The device as claimed in claim 18 wherein the output mode control section has a NA less than 0.22.

21. The device as claimed in claim 9 wherein the planar core includes doped YAG.

22. The device as claimed in claim 5 wherein the pump cladding has a lower refractive index than the refractive index of the core.

23. The device as claimed in claim 22 wherein the pump cladding is sapphire or undoped YAG.

24. The device as claimed in claim 7 wherein the mode control cladding includes a material having a refractive index between that of the core and that of the pump cladding.

25. The device as claimed in claim 24 wherein the mode control cladding includes doped or undoped YAG.

26. The device as claimed in claim 9 wherein the planar core includes a first core member which absorbs the pumping radiation and a separate second core member which either does not absorb the pumping radiation or has an absorption lower than the absorption of the first core member at the pumping wavelength.

27. The device as claimed in claim 9 wherein the device acts as a pair of separate waveguides which are butt-coupled or coupled together by an imaging system.

28. The device as claimed in claim 18 wherein the device is an optical fiber.

29. The device as claimed in claim 28 wherein the means for providing output mode control includes a mode control cladding different from the pump cladding.

30. The device as claimed in claim 29 wherein the device comprises sections of different types of fiber which are either spliced, butt-coupled or coupled together by imaging an output from one section into the other section.

31. A method for generating a laser beam having a desired output mode, the method comprising:

providing a core having a pump input surface and at least one output surface, the core serving as a waveguide in at least one direction;

pumping the core at the pump input surface with pumping radiation at a pumping wavelength so that an output laser beam is emitted at the at least one output surface at an output wavelength; and

separating the functions of pump-light confinement and output mode control to different sections along the length of the waveguide.

32. The method as claimed in claim 31 wherein the core has a laser input surface and wherein the method further comprises transmitting a source laser beam into the core at the laser input surface wherein the source laser beam is amplified within the core and wherein the output beam is an amplified source laser beam.